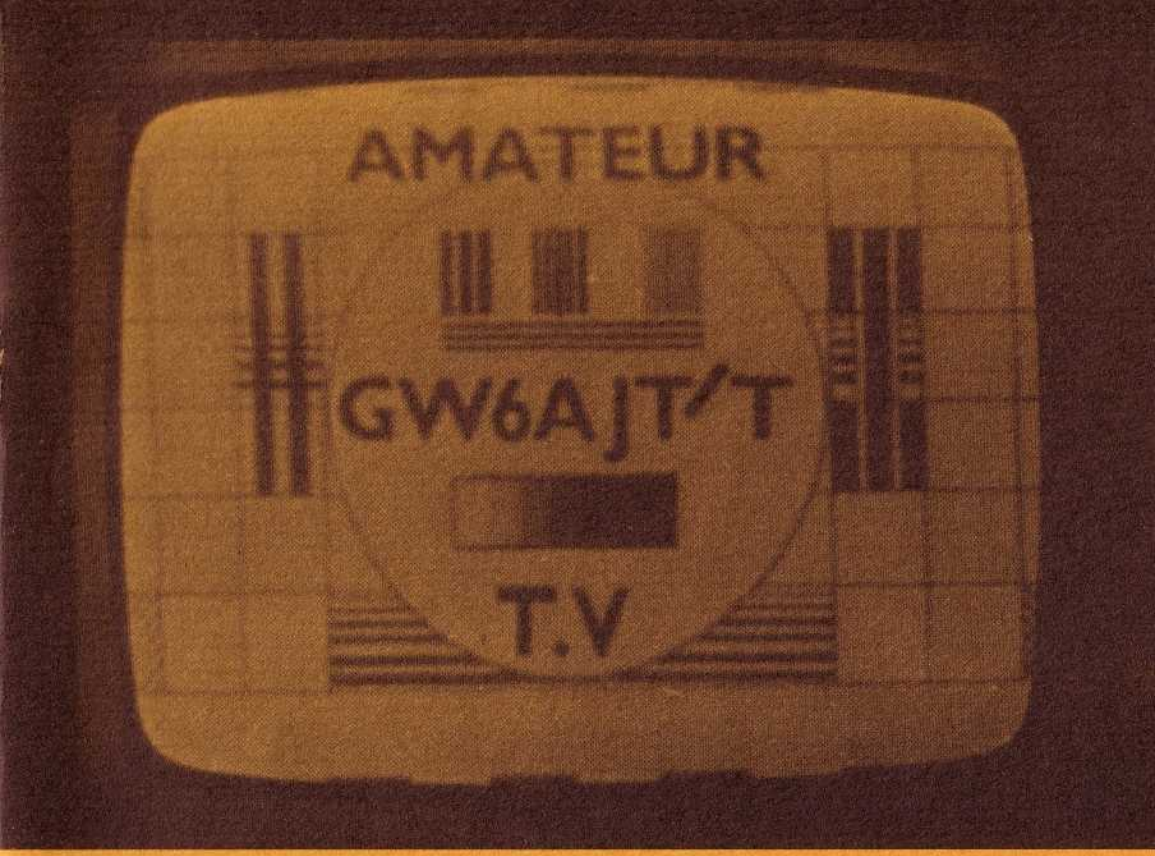


CQ — TV

THE JOURNAL OF

THE BRITISH AMATEUR

TELEVISION CLUB.

NO 89

FEBRUARY 1975

THE BRITISH AMATEUR TELEVISION CLUB

WHO TO WRITE TO

Subscriptions and changes of address should be sent to the Treasurer, and membership enquiries to the Membership Secretary. Please only address your enquiries to the most suitable committee member.

THE EDITOR Andrew Hughes % B.A.T.C Publications.

CONTENTS

Letters to the Editor

Dear Sir,

In the course of experimenting with a flying spot scanner for the production of a 625 line test-card, I ran into the problem of persistance of CRT phosphor causing poor definition.

I contacted Rank Electronic Tubes of Sidcup, Kent and received details of various CRTs for colour telecine and other purposes amongst which was a new Rank development, a phosphor with a decay time less than 0.1 x 10^{-6} secs. This can be used for high definition telecine or FSS without the need for an afterglow corrector. Two tubes are presently available with this phophor, C1850^{-X3} (7", 30kV, 4v 0.1A heater) and C1601^{-X3} (6", 18kV, 6.3v0.3a heater) which cost, new, approx. £300 & £210 respectively (!) R.E.T. are, however, willing to supply sub-standard tubes to B.A.T.C. members at approx. 30% off list price. I have several copies of their abridged data here. I can send these to you if you wish, or members who are interested may contact me direct. If you want full details of R.E.T.'s address etc., I can give it to you for insertion in C Q - T V.

While on the subject of the magazine, I wonder if you would mind inserting a passage to the effect that I would like to get in touch with any other member who is experimenting with, or has experience of, high-definition telecine or test-card generation by means of FSS.

E. Trundle
55 Birch Way,
Hastings,
Sussex. TN34 2JY

Dear Sir,

I take a keen interest in monitoring the Sunday morning SSTV net on 3.640 MHz, but as many of the participants have commented, this part of 80 meters is plagued with continental QRM and who can suggest an alternative U.K. frequency? It's not as easy as it sounds as many of the phone 'types' tend to look upon SSTV as an unwelcome source of noise pollution in 'their' band space. Remember not so many years ago SSB was looked upon with similar trepidation, members of my local radio club look at SSTV with some interest but think of it rather as an expensive novelty and I wonder how we can get the amateur 'public' to accept SSTV as a serious form of communication rather than a gimmick.

Monitor here is Spacemark with improved

picture quality thanks to info supplied by G3CHM, (Thanks Graham)!
David J.A. Noakes,
Mill View,
The Hill,
Cranbrook,
Kent. TN17 3AD

SUBSCRIPTIONS
The Club regrets that all those who have not paid their subscriptions for 1975 will receive no more copies of this magazine. Rising costs prevent us from sending the once customary further issue.

SLOW SCAN NEWS

A video communications system for the transmission and reception of still tv images over dialled telephone lines has been announced by an American company called Colorado Video Inc. The system uses a closed circuit camera and a 12 inch monitor and depends for its operation on a video compressor and a "video expander".

Sampling techniques are used with normal fast scan 525 or 625 line camera and monitor, the sampling rate being 16000 samples per sec; approximately one minute is taken to transmit and receive one still frame.

A 6 bit A to D convertor is followed by a one line digital buffer, allowing a slow read out rate. This drives a 6 bit D to A convertor giving a slow scan picture of 1 KHz bandwidth. An fm modulator couples the signal to speech circuits.

The video expander is a computer type terminal with a 12 inch magnetic disc store allowing for image storage; it produces a composite video output from the fm slow scan.

Only one snag for amateurs - the system costs about 9000 U.S. Dollars!

POSTBAG

Robert Leyland ZL1TRM in Auckland, New Zealand has written with some news of activity in his area. Himself and ZL1TOF, ZL1TCL, ZL1TKL, ZL1TPE and others are all active on slow scan. The local 70cm band (which is 420 - 449 MHz in New Zealand) is divided into several tv channels so there is plenty of room for many amateurs. The only problem is parts, which are very difficult to come by. However, many amateurs (including 'TRM) are still busy constructing.

Stephen Driver G8JNK is at the University of Surrey, Guildford and with G8IEF is building up a 70cms tv rig. He has a $\frac{2}{3}$ inch vidicon camera and is starting to modify some old 70 cm gear obtained from the University Radio Club G8AHK. He would like to hear from anybody in the Guildford and surrounding area who is interested in tv. Steve hopes to be on the air over Christmas and early in the following term, and has applied for a /T licence.

L.W. Homan-Berry G3OXZ is a slow scan addict and spends a lot of time watching for SSTV pictures via Oscar 6 and 7 Satellites. He has been trying for some time to transmit pictures himself and has heard his own signals on 10 meters on several occasions but has not received any reports of the transmission being heard by anyone else. If anyone has copied his signals via other of the

satellites he would be grateful to hear of it. He finds that he can access Oscar 6 using a Multi- 2000 and an eight element beam, and that more power is required for Oscar 7 which has a fault in the receiver.

HELPFUL HINT

Looking for a cheap tripod for that Vidicon camera? Try a Boots Pack-away Projector Stand. This is of tripod construction with an adjust-able centre column and takes a standard pan and tilt head. The maximum height is 46.5 ins and the price, if still available is £3.72p.

B. A. T. C. LIBRARY

This is a further list if items held by the B.A.T.C. Librarian, all on free loan to members. When requesting copies, please note that you must be a member before the book can be posted to you.

Previously we have asked for a stamped addressed envelope with requests for loans, but in view of the variable size of books, could borrowers now not send S.A.E.s but undertake to reimburse postal charges when returning items.

Other library lists were published in C Q - T Vs Nos.

EMI	Power Supply 228	TL1082
Bush Murphy	Picture Monitor MR773 Mk II	
Tektronic	Oscilloscope 547	
Tektronic	Dual Trace Plug-in 1A1 (s/n 20,000 up)	
Tektronic	Mod 188G for 528 waveform monitor	
Marconi	Monitor Reg. Power Unit BD653A	T3152
Marconi	Mobile monitor reg. power unit BD653G	
Marconi	Reg. Power Unit 4550	
Marconi	Reg. Power Unit BD654 C/D	T2349/1
Marconi	Reg. Power Unit BD641 B/C	
Marconi	Sawtooth generator 1877A and C (Diagram)	
Marconi	Black and White generator 1880 A and C (Diagram)	
Marconi	Sync Generator Mk II (Diagram)	TD151012
Marconi	Automatic Genlock Unit BD885 (Diagram)	T3477
Cintel	Multiplexed FSS Equipment (Diagram)	258

A novel use for a varcap tuner

B Summers G6AJU'T

When constructing a vestigial sideband television transmitter (VHF Communications, editions 1 and 2, 1973), I found a novel use for a varcap tuner to aid the transmitter alignment.

The varcap is swept over the 70 cms band by the X sweep from an oscilloscope. The IF output from the tuner is fed to a receiver, ideally at 39.4 MHz., although 30 MHz. will sometimes work with re-adjustment of the IF transformer in the varcap tuner.

The Y input to the oscilloscope is directly coupled to the receiver detector. A search probe of one or two turns is connected to the aerial input of the varcap via some co-axial cable and possibly an attenuator to prevent damage to the front end of the varcap tuner.

As the sawtooth voltage from the oscilloscope increases the varcap tuner over the TX output producing a pulse corresponding to the carrier and side-band(s) from the TX. The sweep width and centre point are set by VR1 and VR2. It is important that the oscilloscope "sees" the D.C. voltage developed at the detector. The sweep speed should not be too great or the pulse output will be distorted.

References

C Q - T V No. 81 Varcap Connections
Practical Television November 1971.

FROM C Q - T V DECEMBER 1950

DEC 50 "A postage due letter has come from G3--- saying he is now licensed for UHF tv; after due celebration and black coffee the next morning he removed the panels disguising the tv transmitter as "Whistler's Mother" and the trip wire from the door! He would be glad to show the G.P.O. round the shack now, although since he has no licence for the tv receiver, he has put a BC221 panel in front of it - anyway, he doesn't think much of B.B.C. programmes!"

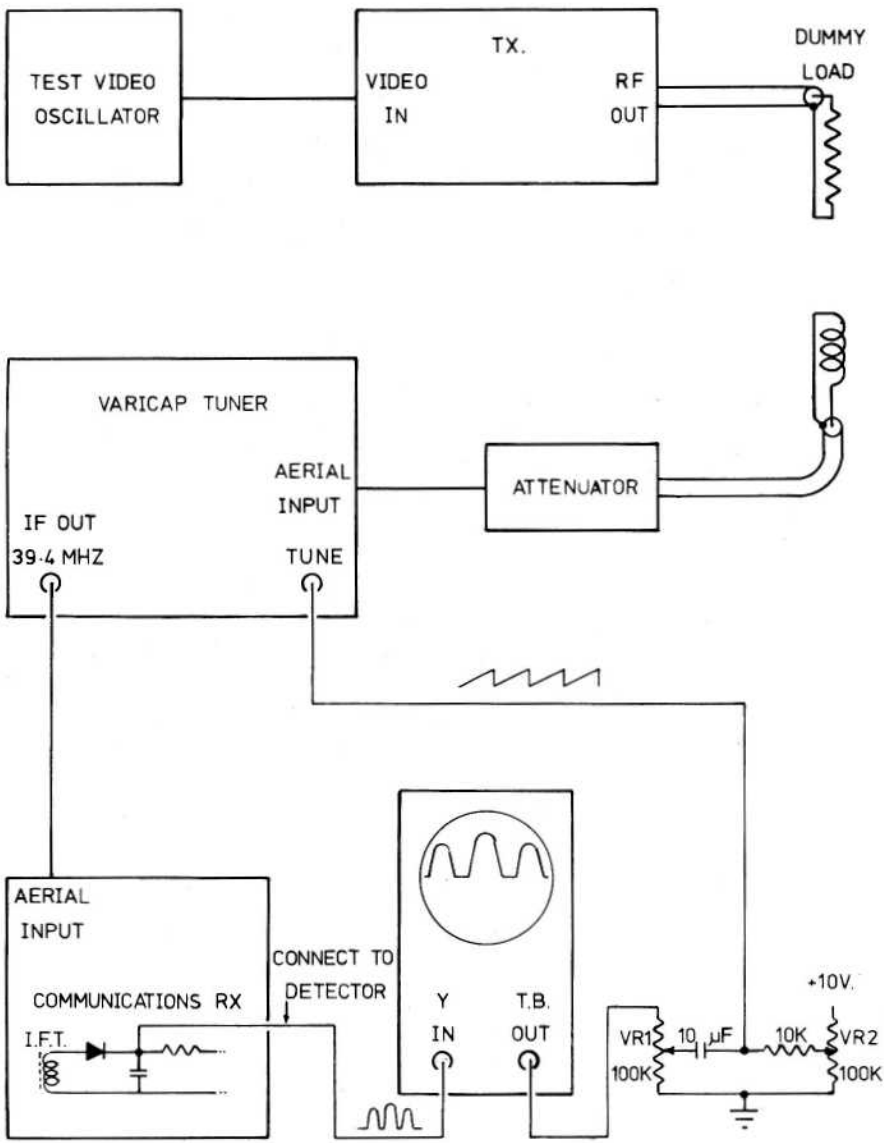

TEST VIDEO
OSCILLATOR
TX.
VIDEO
IN
RF
OUT
DUMMY
LOAD
VARICAP TUNER
AERIAL
INPUT
IF OUT
39·4 MHZ
TUNE
ATTENUATOR
AERIAL
INPUT
COMMUNICATIONS RX
I.F.T.
CONNECT TO
DETECTOR
Y
IN
T.B.
OUT
+10V.
VR1
100K
10 µF
10K
VR2
100K

FIG.1

MORE FACTS ON FAX

J J Wilcox G8GGU

After reading Prof. Fanti's article I feel we must mention the very important area of "business" FAX which, if its existing growth continues, will probably be the largest source of redundant equipment in the future.

Since the standards used do differ somewhat from those already given, let us make note so that extensive modifications do not have to be made as and when the equipment does start to appear.

Business FAX uses for communication the Post Office 600 ohm pair and hence has an audio output which may be used to modulate a R.F. carrier in the usual way. At this point in time the Home Office will give, to a G8, permission to transmit A4 on 432 MHz using a bandwidth of not more than 6 KHz. Application has been made for F4 and A4J but at the time of writing no reply has been received. No problems are expected however, if the Home Office are helpful again as I have found them to be in the past.

If we look at the specifications of the numerous machines in the business field we find a number of variations upon the two basic standards. These are those laid down by the CCITT for the east side of the Atlantic and by the E.I.A. or U.S. Military for the west side. Using the same specification heading as Prof. Fanti will help cross-reference, so.....

1) Drum Speed

The most accepted speed is 180 r.p.m. giving a line frequency of 3 Hz.

2) Drum Diameter

(a) CCITT 68.5 mm (2.7 ins) dia. for drums and a line length of 215 mm (8.5 ins) for flat beds
(b) E.I.A. recommend a line length of between 8.5 and 9.2 ins.
(c) U.S. Military ask for a 8.64 ins line length.

3) Index of Co-operation

A geometrically accurate copy will be reproduced when both machines have exactly the same index. It is defined as follows:

(a) CCITT, drum diameter (ins.) multiplied by the number of lines per inch. recommendation 264.
(b) U.S., length scanned line multipled by the number of lines per inch.

recommendation 829.
This is the CCITT multiplied by "pi".

4) Length of drum
I can find no recommendation since some machines use cut sheet and others rolls of paper. An average drum is about 300 mm long.

5) Scanning Density
An average machine should give a horizontal resolution of at least 3.5 lines/mm.

6) Direction of Scan
Left to right across sheet. Frame scan can then be either way since we will always get a correct copy.

7) Dead Sector
(a) CCITT, drum 5 mm (0.6 ins), flat bed machines are assumed to be the same but I can find no direct reference.
(b) E.I.A. ask for not more than 0.5 ins for a line length of 8.5 ins and up to 0.7 ins for lines 9.2 ins. long.
(c) U.S. Military quote 2% of the line length.

The pulse is usually a white signal in black and most often used for synchronisation and phasing.

8) Selection of Index of Co-operation
There is no general selection signal and most machines are often only compatible with each other. If a different line rate is to be used this is usually communicated verbally by hand set.

9) Synchronization
After phasing, scanning frame speed tends to be tied to the local mains frequency and errors of over 1% are rarely exceeded even over world-wide links. The highly accurate scan rate that is asked for in some cases is in practice apparently not required. The line speed is usually held stable by driving the drum motor from a crystal oscillator.

10) Starting
usually held stable by driving the drum motor from a crystal oscillator.

10) Starting Recorders
Usually upon receipt of phasing signals, a machine will start.

11) Phasing
A 15 second period is recommended by the U.S., consisting of a 25ms white pulse. Most machines use this 15 sec. time period, although the pulse length does vary a lot.

12) Adjustment of Recording Level
In AM the level will be referred to the amplitude of the phasing signals. In FM (or more accurately AFSK) the level is preset to the received frequency.

13) Stopping Recorders

Most units send a "stop tone" which tends to vary in frequency between machines. 1100 Hz is a good average. Machines also usually stop if data is lost for longer than a pre-set period.

14) Modulation Characteristics

(a) AM. U.S. Military recommend a carrier of 2,400 Hz and the CCITT one between 1,300 and 1,900 Hz.

(b) AFSK (FM) U.S. Military fc 1,900 Hz
f white 1,500 Hz
f black 2,300 Hz

CCITT fc 1,700 Hz
f white 1,300 Hz
f black 2,100 Hz

With CCITT white and black frequencies may be reversed.

15) Levels of (AM) Signals

Regret AM data is not obtainable due to not having used same. However an average AFSK machine will cope with a -50dbm signal.

16) Contrast Ratio

In business FAX the control and picture signals tend to be of the same level. The equipment visually gives a picture contrast in excess of a seven step grey scale.

17) FAX Transmission over Radio Circuits

We have a AM or AFSK signal which we then use to modulate our RF carrier in the usual way, subject, of course, to having the necessary Home Office permission.

18) Scanning Rate

(a) CCITT 120 to 180 lines per minute.

(b) U.S. Military 90 or 180 lines per minute.

(c) E.I.A. call for a scan rate of $1\frac{7}{8}$ ins per minute.

What you have on the average business FAX machine (3 Hz, 180rpm) is if you take 6 minutes for a A4 sheet (long edge) you will have 96 lines per inch and for 4 minutes 64 lines per inch.

There are attempts being made today at reducing these scan times by redundancy dumping of irrelevant areas. The then produced second generation machines will have a self-compatibility problem with first generation units. This will, hopefully, make early machines available to amateurs.

19) Recommendations by G8GGU

Based upon equipment at present in use and which conforms to CCITT standards together with easy interface to other units.

(a) Drum speed: 3 Hz (1,2, & 4 Hz selectable)

(b) Drum size: 70 mm diameter x 70 mm long for a 1:1 aspect ratio, but will need to be 300 mm long for weather maps etc.

(c) Scan Rate: 64 or 96 lines/inch

(d) Co-operation index: 264 or 176
(e) Sync/phasing: 15 sec period, 4% white pulse in black level at start of line.
(f) Scan direction: left to right
(g) Modulation: AFSK to A4, F4 or A4J
(h) Tones: Carrier 1700 Hz
White 1300 Hz
Black 2100 Hz
Stop 1100 Hz
(Picture inversion should be available unless you want negative weather maps)

So "there you go", a suggestion, results are good, the compatibility of frequencies with RTTY will not have escaped the notice of the observant, simplifying things for do-it-yourself control units. We will also have a fairly geometric copy of met. charts since using Pro.f Fanti's data it works out to an 18.5 inch line length on a 152 mm diameter drum with 48 or 96 lines per inch at 1 or 2 Hz.

I regret that I cannot go into the actual operation of the "whirly bits" at this time, but it is hoped to be able to produce a more technical article at a later date.

Any criticism good or bad, would be of help since we need a FAX standard now, not later, when we find ourselves caught up in a web of non-compatibility.

I would like to thank Alan Turner BRS22156 for his encouragement to write this article and to Steve Smith BRS35038 and Ron Sholder G8FJG for their help in running tests. See you F4 on 70.

SUBSCRIPTIONS

Please note that all subscriptions to B.A.T.C. are due on 1st January 1975 and the Treasurer would be grateful if members could remit their £1 to him as soon as possible after that date. Those who pay by Bankers Order help the Club by reducing the administative effort, and anyone wishing to pay this way can apply to the Treasurer for the necessary form. Please note that receipts will only be issued if asked for at the time of payment.

B.A.T.C. has arranged for a GIRO account and this has the number 25 612 4000. Would you please note that this is for subscriptions ONLY and not for Club Sales or Publications.

If you notify the Treasurer of a change of address, please mention your old address to help him identify you in the records.

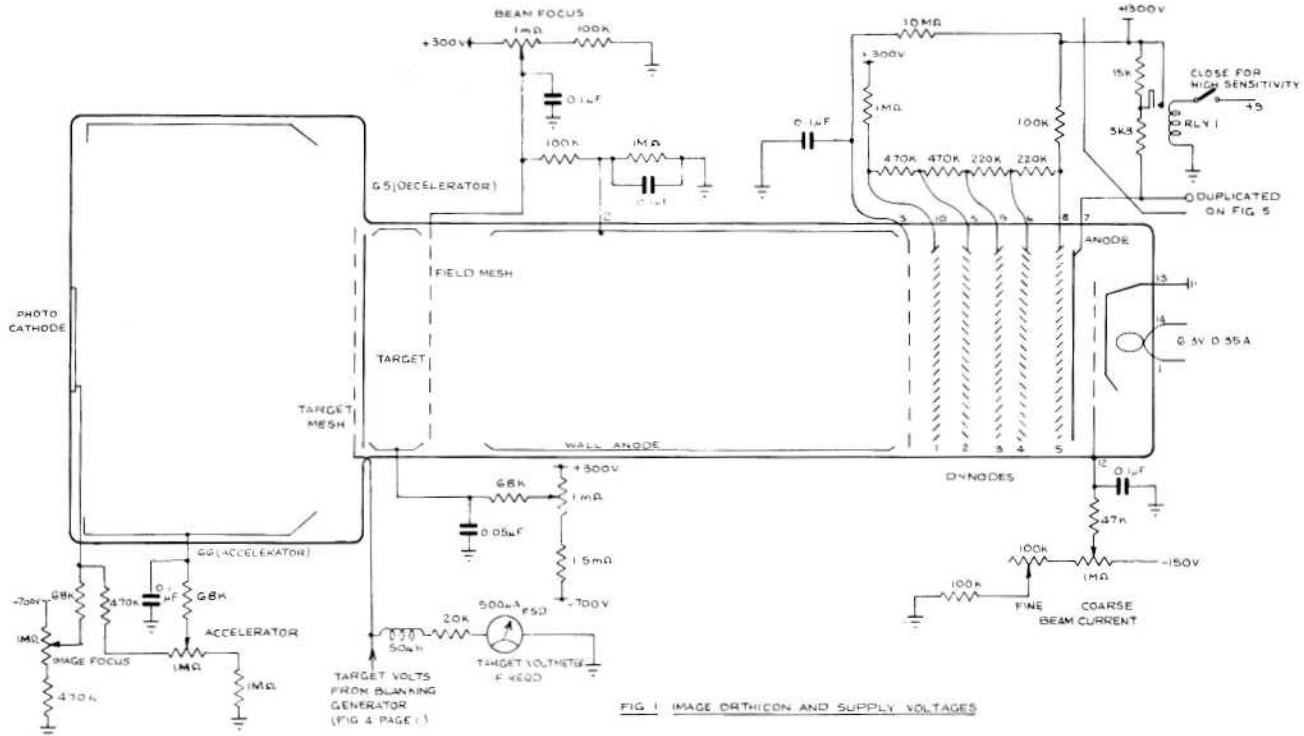


FIG 1 IMAGE ORTHICON AND SUPPLY VOLTAGES

AN IMAGE ORTHICON CAMERA

P. Hayes

PART 1

This article describes the design and construction of a $4\frac{1}{2}$ inch Image Orthicon camera channel, the basic requirement being sensitivity together with good definition and operational stability. I do not expect anyone will wish to build a "carbon copy" but the design is presented here in the belief that the reader will find some part interesting. I have attempted to make the design simple to operate and free from external connections, only requiring power and a picture monitor connection. Some knowledge of the I.O. is useful in obtaining the best results;

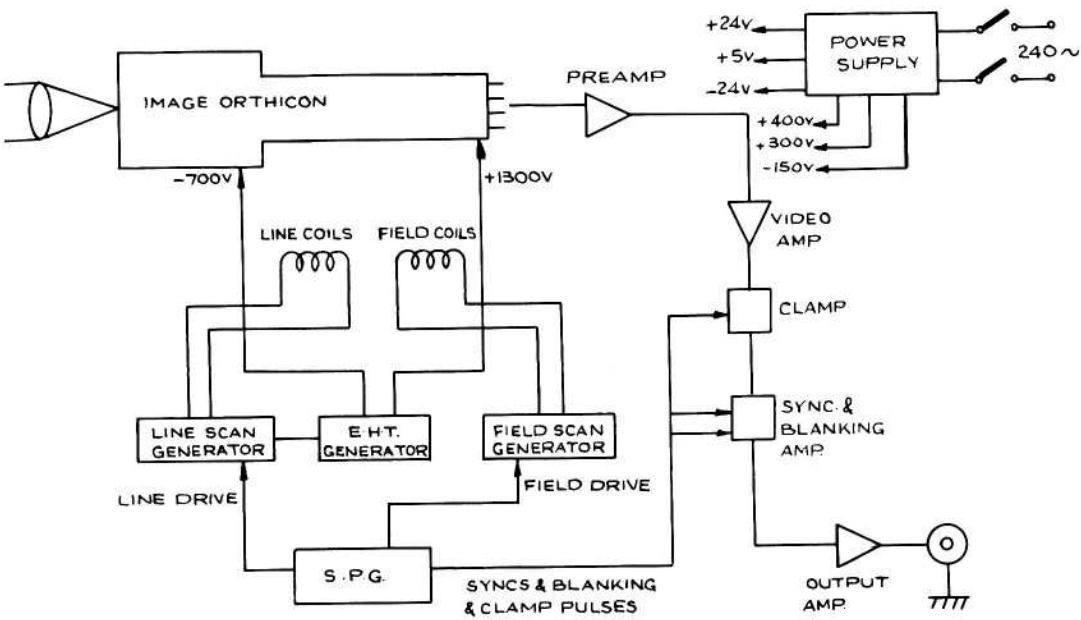


FIG 2. OVERALL BLOCK DIAGRAM.

Fig. 1 illustrates the internal construction of the tube, and tube controls. A full description would occupy an issue of C Q - T V by itself!

Fig. 2 shows the block diagram of the complete channel and is more or less self explanatory. Fig. 3 is the block diagram of the S.P.G. The S.P.G. is simply constructed out of four SN7490 integrated circuits, as shown in Fig. 4. A twice line frequency oscillator is fed into a ÷2 and a ÷625 thus producing interlaced line and field rate signals. These are used to generate syncs, blanking and clamping pulses. By disabling the divide chain (removing +5v), and feeding in external line and field drive pulses to points A and B on Fig. 4, the camera can be run from an external S.P.G. With careful adjustment of pulse timing, the channel can be made sync at a remote mixing point. The transistors are mainly cheap PNP components salvaged from ex-computer boards. Any RF transistor will do: slight adjustment of the bias potential divider in each of the White monostable multivibrators may be necessary in some cases.

Fig. 4 also shows the target bias and blanking generator. Essentially this consists of a mixed blanking amplifier, and a clipper arranged to limit the positive peak to a maximum of 5 volts, controlled by the dc bias on Q15. The back to back Zener diodes across the output clip the negative excursion to -8.2v and limit the maximum positive excursion to 5.1v in the event of component failure in the clipper. The I.C. can be damaged by excessive target voltage. A delay line is used to generate the front porch period and the clamp pulses; monostables would be equally suitable, but would need to be high speed types or an IC such as SN74121. Note that the output pulses are not at the standard level.

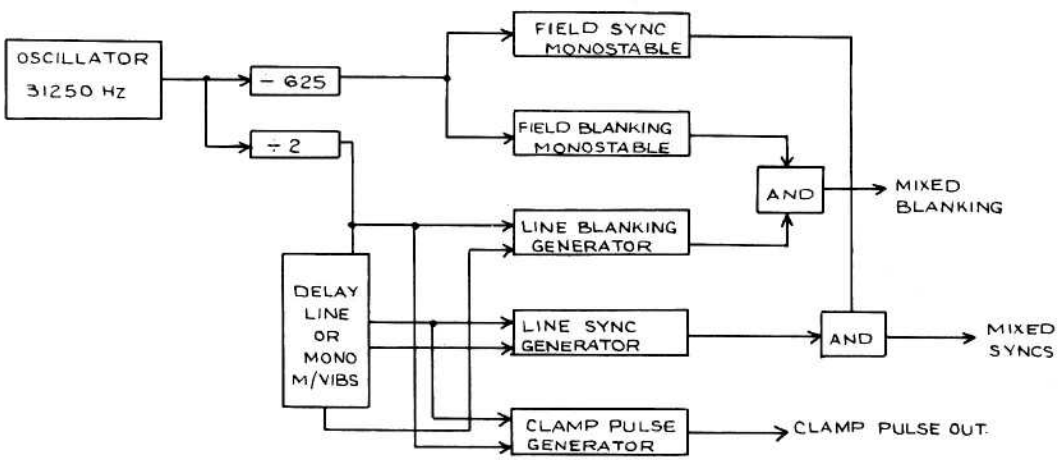
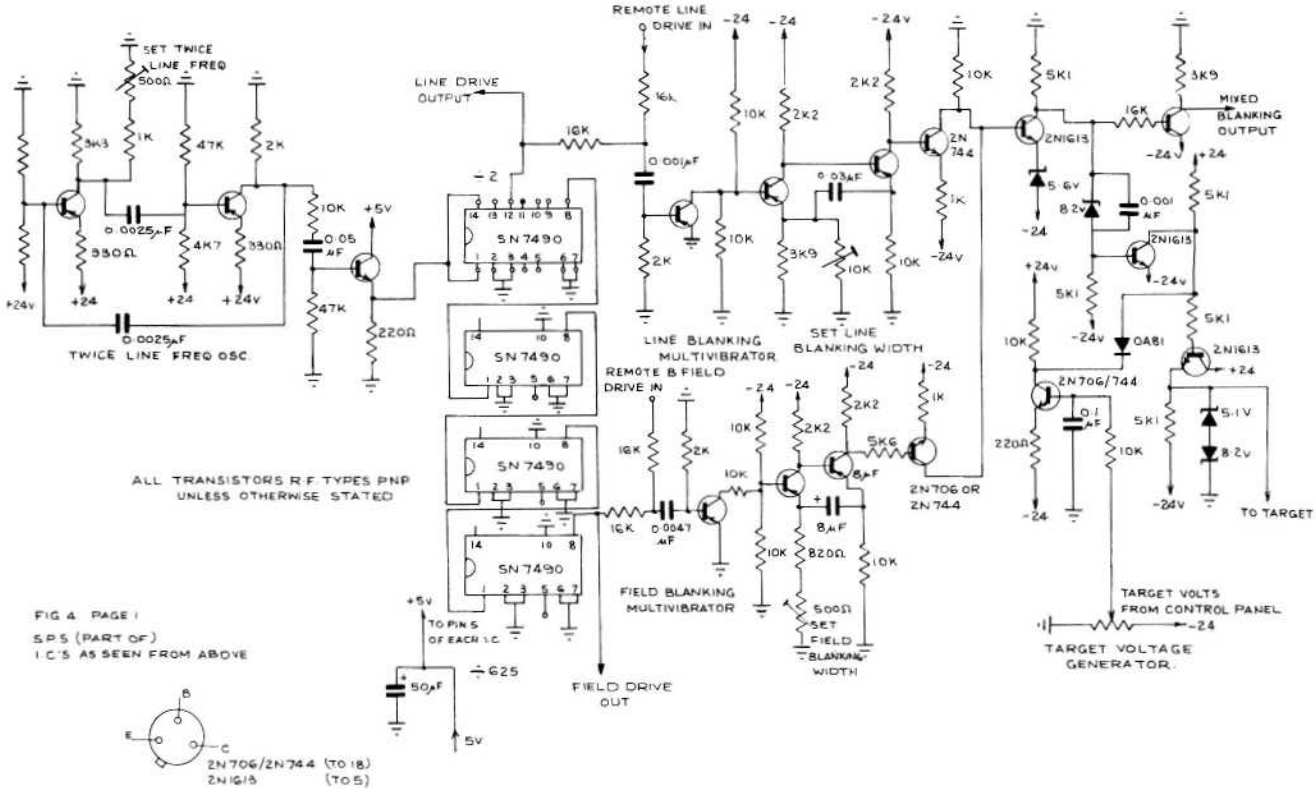


FIG. 3. S.P.G. BLOCK DIAGRAM


SET TWICE LINE FREQ
500Ω
3K3
1K
47K
2K
330Ω
4K7
330Ω
+24v
+24
+24
+24v
0·0025μF
0·0025μF
TWICE LINE FREQ OSC.
10K
0·05 μF
47K
+5V
220Ω
LINE DRIVE OUTPUT
÷2
SN7490
SN7490
SN7490
SN7490
ALL TRANSISTORS R.F. TYPES PNP UNLESS OTHERWISE STATED
FIG 4 PAGE 1
S.P.S. (PART OF)
I.C.'S AS SEEN FROM ABOVE
B
E
C
2N706/2N744 (TO 18)
2N1613 (TO 5)
+5V
TO PINS OF EACH I.C.
50μF
÷625
5V
FIELD DRIVE OUT
REMOTE LINE DRIVE IN
16K
0·001μF
10K
2K
LINE BLANKING MULTIVIBRATOR
-24
-24
2K2
10K
0·03μF
3K9
10K
SET LINE BLANKING WIDTH
-24v
2K2
10K
2N 744
1K
-24v
5K1
2N1613
5·6V
8·2V
0·001 μF
-24
2N1613
-24v
10K
+24v
5K1
-24v
OA81
2N706/744
220Ω
0·1 μF
10K
-24
5K1
5·1V
8·2V
-24v
TO TARGET
3K9
MIXED BLANKING OUTPUT
16K
-24v
+24
5K1
REMOTE B FIELD DRIVE IN
16K
2K
0·0047 μF
FIELD BLANKING MULTIVIBRATOR
-24
-24
10K
2K2
10K
8μF
820Ω
10K
500Ω SET FIELD BLANKING WIDTH
-24
2K2
5K6
8μF
-24
1K
2N706 OR 2N744
TARGET VOLTS FROM CONTROL PANEL
-24
TARGET VOLTAGE GENERATOR.

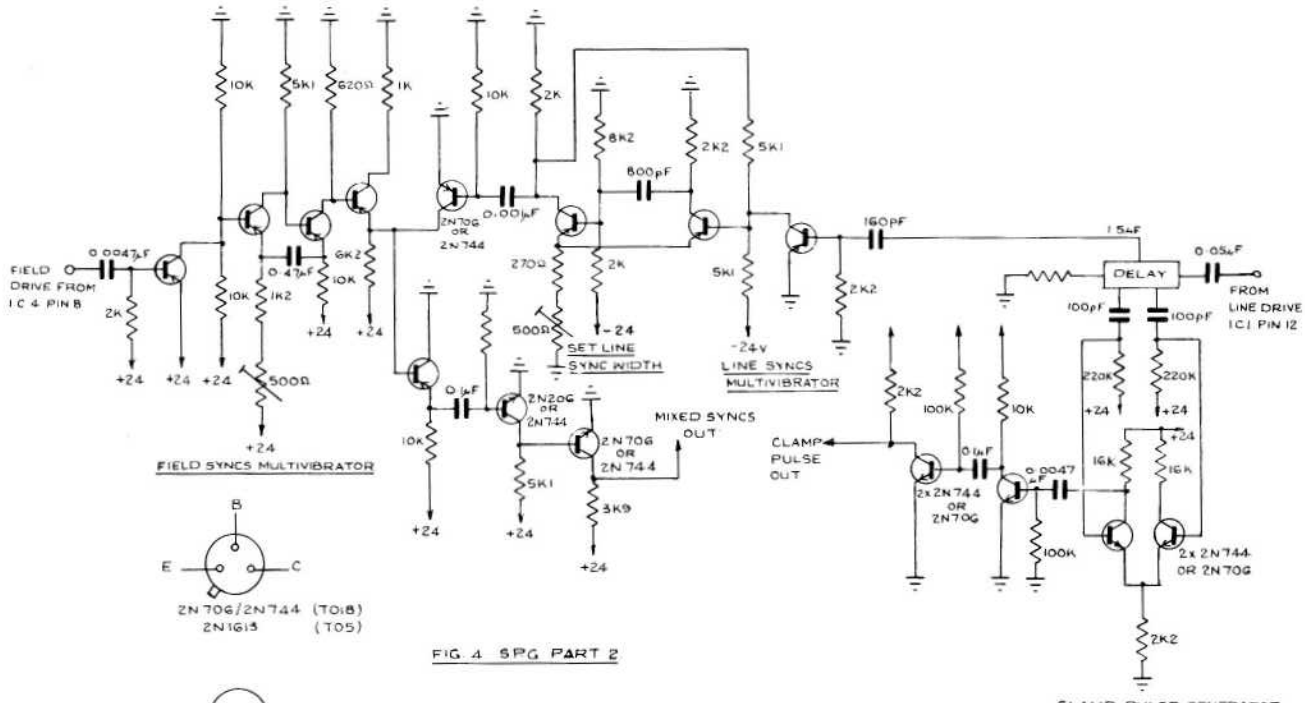


FIG. 4 SPG PART 2

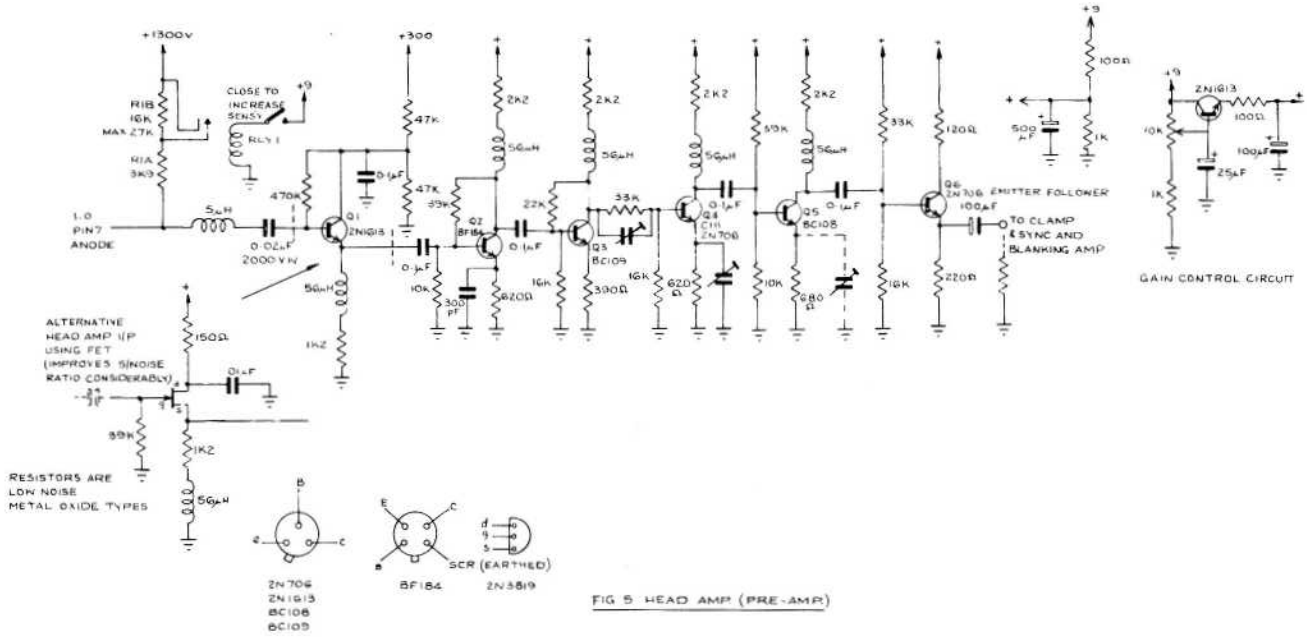


FIG 5 HEAD AMP (PRE-AMP)

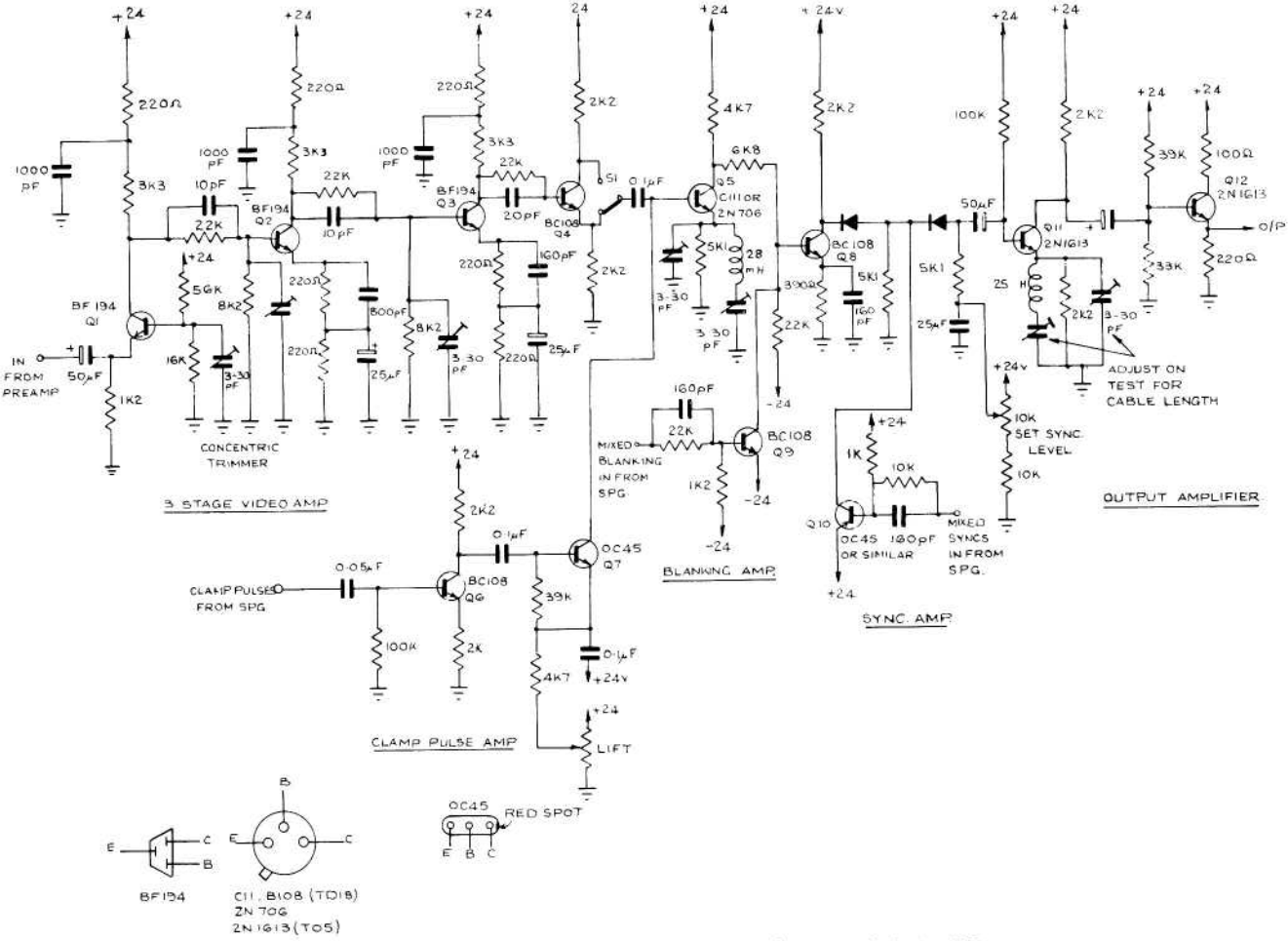


FIG 6 CLAMPING SYNC & BLANKING AMPLIFIER

Fig. 5 shows the video amplifier. The output of the I.O. is developed across RIa. For use in low light conditions a further fixed resistor, RIb, is switched in by a reed relay, Rly1. This provides a higher output voltage at the cost of definition. This loss of definition can be compensated for to a certain extent provided a low noise head-amplifier is used. If RIa + RIb were in circuit all the time, the tube output would severely overload the head amp under normal conditions. Q1 is connected as an emitter follower to present the tube with a high impedance load, L1 separates the tube output capacitance from the head amp input capacitance. Q2 -5 amplify the signal up to about 0.5v p-p, and apply hf correction using standard high-peaking techniques. The signal is fed to the clamping and sync mixing amplifier. Before clamping the signal is raised to about 5v p-p by QI-3 on Fig. 6. Q4 is unity gain phase splitter, S1 selects the required polarity, giving positive or negative pictures. The signal is coupled to Q5 via a 0.1uf capacitor. Clampin occurs at the base of Q5. The clamp pulses from the S.P.G. board are raised to 24v p-p by Q6 which is driven hard on by the clamp pulses. Q7 is also driven hard on during the clamping time and this results in the base of Q5 being returned to the emitter voltage of Q7, which is itself set by the "lift" control. Syncs and blanking are added in the following two stages, and the composite output amplifier by Q11. The hf response is trimmed up in this stage, and matched to the output cable by emitter follower, Q12.

To be continued in the next issue of C Q - T V.

A TRANSISTOR TRANSMITTER

This simple low power transmitter design was sent to us by Eddie Cretier, a Dutch member, from a design by PAØTEI/T. It has been built by several amateurs in Holland and works well; it is also suitable for the earlier stages of a more powerful transmitter using, for example, a QQV03/20 and 4CX150 to follow, running in a linear mode. As drawn the design would be suitable for transmission over short distances, say for local demonstrations.

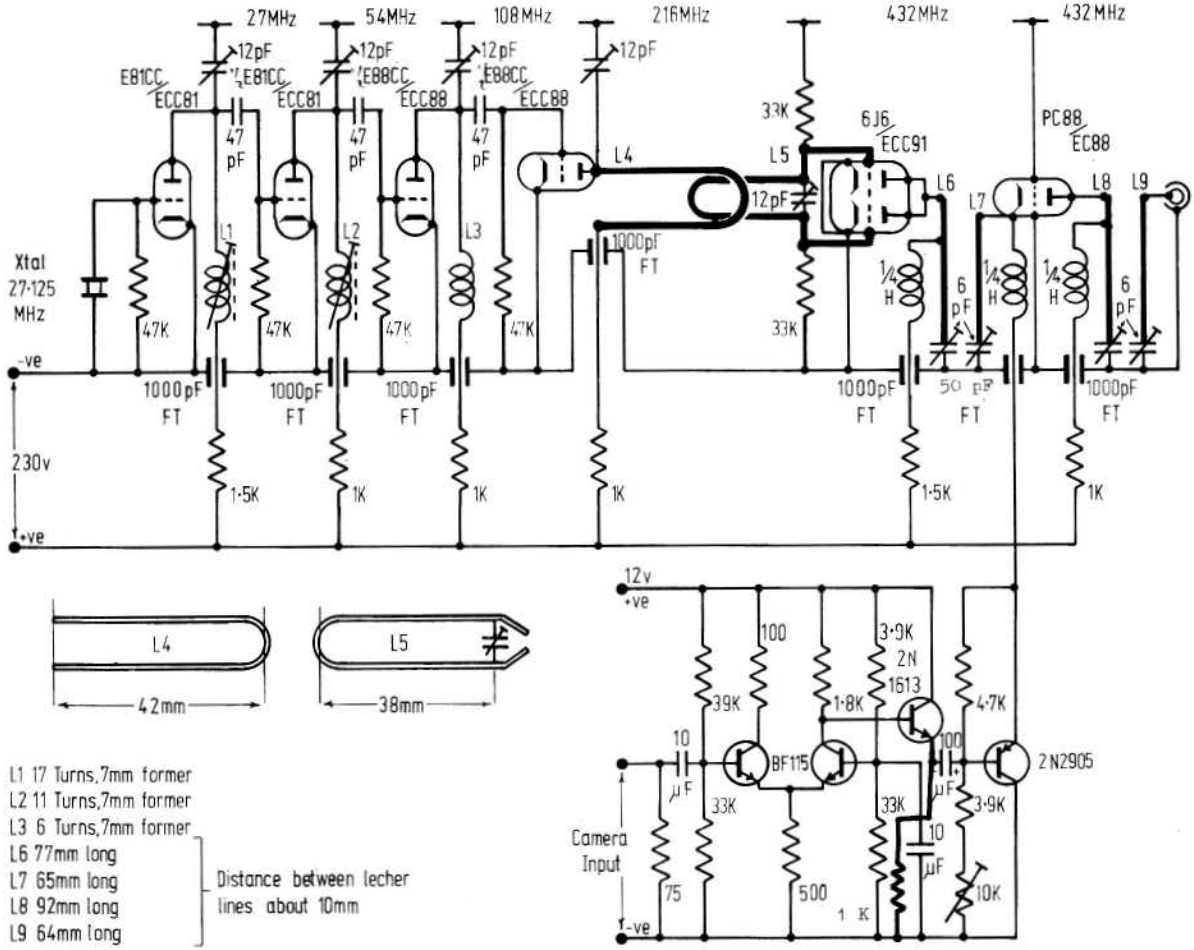
The circuit uses a series of doubler stages from a 27 MHz overtone oscillator, tuning of each stage being by a small variable capacitor. It is important to provide adequate screening between the cathode and anode tuned circuits of the ECC91 and ECC88 stages. Also, the modulator should be well screened from the r.f. circuits, and the lead between th 2N2905 emitter and the ECC88 cathode should be as short as possible. The modulator accepts a positive going signal and provides negative modulation.

Eddie Cretier uses this transmitter at his QTH but has so far never worked a British tv amateur on 70 cm (although he has done so on SSB using 500mW on 70). He wonders if any G on the North Sea coast could contact him in vision some time.

The Editor would like to thank Eddie Cretier, Dave Lawton who wrote the above notes and Alan Outhwaite who drew the circuit diagram, for their help and cooperation in the preparation of this article.

This photo was taken by John Lawrence, GW6JGA/T, during a portable expedition on a hill above Prestatyn, North Wales, in June 1974. G6ADL/T Bill Pilkington, lives in Walton le Dale, Lancashire and the path length is 42 miles.

The cover photo was also taken by John of signals he received from GW6AJT/T Alan Autly in Rhyl, this time over a path length of 4 miles.



L1 17 Turns, 7mm former
L2 11 Turns, 7mm former
L3 6 Turns, 7mm former
L6 77mm long
L7 65mm long
L8 92mm long
L9 64mm long

Distance between lecher lines about 10mm

5th World SSTV Contest

Sponsored by cq elettronica Magazine

The Italian Magazine **cq elettronica** and the American **73 Magazine** have pleasure in announcing the 5th Worldwide Slow Scan TeleVision Contest.
The purpose of this Contest is to promote increased interest in the SSTV mode of operation as used by Radio Amateurs.

RULES

1) **PERIOD OF CONTEST**
Part 1 15.00 - 22.00 GMT on February 8th 1975
Part 2 07.00 - 14.00 GMT on February 9th 1975

2) **BANDS**
All authorised frequencies within the 3.5 - 7.0 - 14.0 - 21.0 & **28.0 MHz** bands.

3) **MESSAGES**
Messages will consist of: Exchange of pictures and also included are a) the call sign; b) report (RST); c) serial number.
The serial number must start at ØØ1 and is increased by one for each successive contact during the period of the Contest and the serial number is irrespective of the Band(s) used.
Exchange must be made **exclusively** with the SSTV mode. For the - W - are accepted the FCC Rules.

4) **EXCHANGE POINTS AND MULTIPLIER**
a) Contact score 1 point per contact on the 3.5, 7.0, 14.0 21.0 MHz Bands. 2 points per contact on the 28.0 MHz Band.
b) A multiplier of 5 points for each Continent (Max 30 points) and 2 points for each Country (ARRL List) worked can be utilised on each band. In addition to the ARRL List will be considered as separate Countries the W call areas WØ to W9 and VE Call areas from VO to VE7.
The same Continents and Country is only valid once on each Band. The same station can only be worked once on each Band (Max 5 contacts) during Contest period.

5) **SCORING**
Total exchange points multiplied by the multiplier total.

6) **HANDICAP**
Winners of precedent Contest: less 6 % of the total final score.

7) **SECTIONS**
a) Entrants transmitting and receiving video.
b) Entrants receiving video only. For this purpose the same general rules apply and the same station heard is valid once only on each Band.
A separate results table will be made for each of these two classes of entry.

8) **LOGS**
Logs should contain: Date, Time of contact (GMT), Band in use, Call sign, Report (RST) sent and received, Serial numbers sent and received, points, multipliers and final score.
Although not essential, it would be appreciated if entrants could enclose a cover sheet with a short description of the Station (With photo if possible) together with any comments on the Contest.
All entrants are kindly requested to report on any serious Contest irregularities e.g Exchanges in other modes.
For entrants in the b. Classification it is only necessary to record the message of the station heard.
All Logs must be received by not later than March 25th 1975 in orden to qualify

Send them to:

Prof. Franco Fanti
Via A. Dallolio n. 19
40135 Bologna ITALY

9) **PRIZES**
1° A free 1¿ month's subscription to **cq elettronica** Magazine
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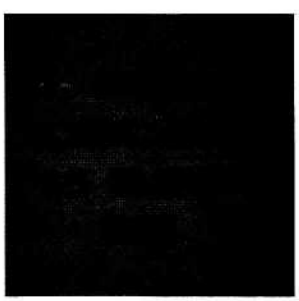
10) **RULES OF BEHAVIOUR AND PENALIZATION.**
The Logs must be compiled in accordance with the Rules listed in (7). The contacts must be made by means of the SSTV mode and it is not permitted to use other mode of transmission either before, during or after the exchange of message by Slow Scan TeleVision.
During the Contest it is expecter that Amateurs will observe the fundamental rules of courtesy and good operating during contacts.
Failure to observe any of the above Rules will result in the exclusion of the entry from the final results and any such Logs received will be considered as check Logs.
All Logs received become the property of the Edition CD and will not returned.
The decision of the organising Committee in any dispute will be final and any subsequent controversy cannot be referred to the Civil Court.



This picture was recorded via Oscar 6 on Sunday 30th September 1974 at 1830 GMT by G3 OXZ L. W. Homan-Berry.

LETTER from NORWAY

Jostein Gjerde LA7MC

FACSIMILE RECEPTION

In the latest issue of C Q - T V there was an article about FAX which I read with great interest. I have done some experiments with FAX-reception which I have described in an article in the Norwegian ham-magazine "Amator-radio" (No. 6 1973).

I thought it could be of some interest to show how I have suceeded to copy commercial FAX-transmissions.

I bought a "Deskfax" from USA. The drum speed did not match with the speeds used in commercial transmissions. With 60 Hz line the speed is 180 rpm but with our 50 Hz line the speed is 150 rpm. The first thing I did was to change the wheel transmission so I got 60 and 120 rpm on 50 Hz. line. I bought the new wheels from Clas Ohlson, Insjon, Sweden.

The frequency stability was insufficient when feeding the motors from the line. I therefore made 2 Class B Audio amplifiers with 2N3055 output transistors and 115 volt transformer output fed from astable multivibrators, and the one governing the drum speed was triggered from a sync generator synchronised by a 100 KHz crystal.

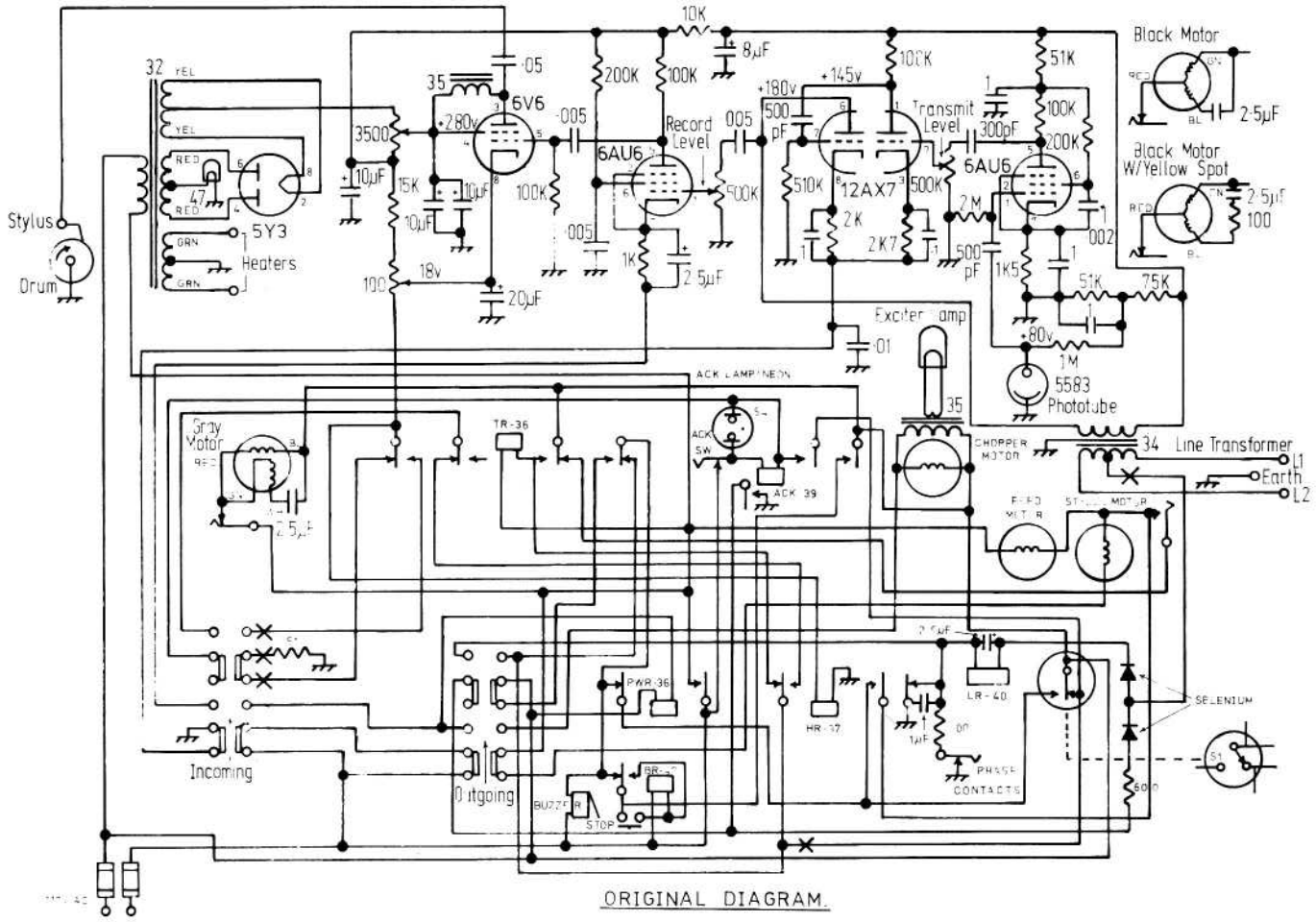
I removed all the relays from the Deskfax and reqired it as shown in the diagram. I also removed the chopper motor and wheel.

And now to the modulation of the writing pen: I am working RTTY with a ST-6 converter. This converter has a linear discriminator with approximately the same bandwidth as the FAX transmissions. I also have a phase shift monitor scope permanently connected to the ST-6. Consequently, I could pick up signals from the linear discriminator directly into the signal amplifier of the Deskfax and enjoy the facilities of the phase shift scope also when receiving FAX.

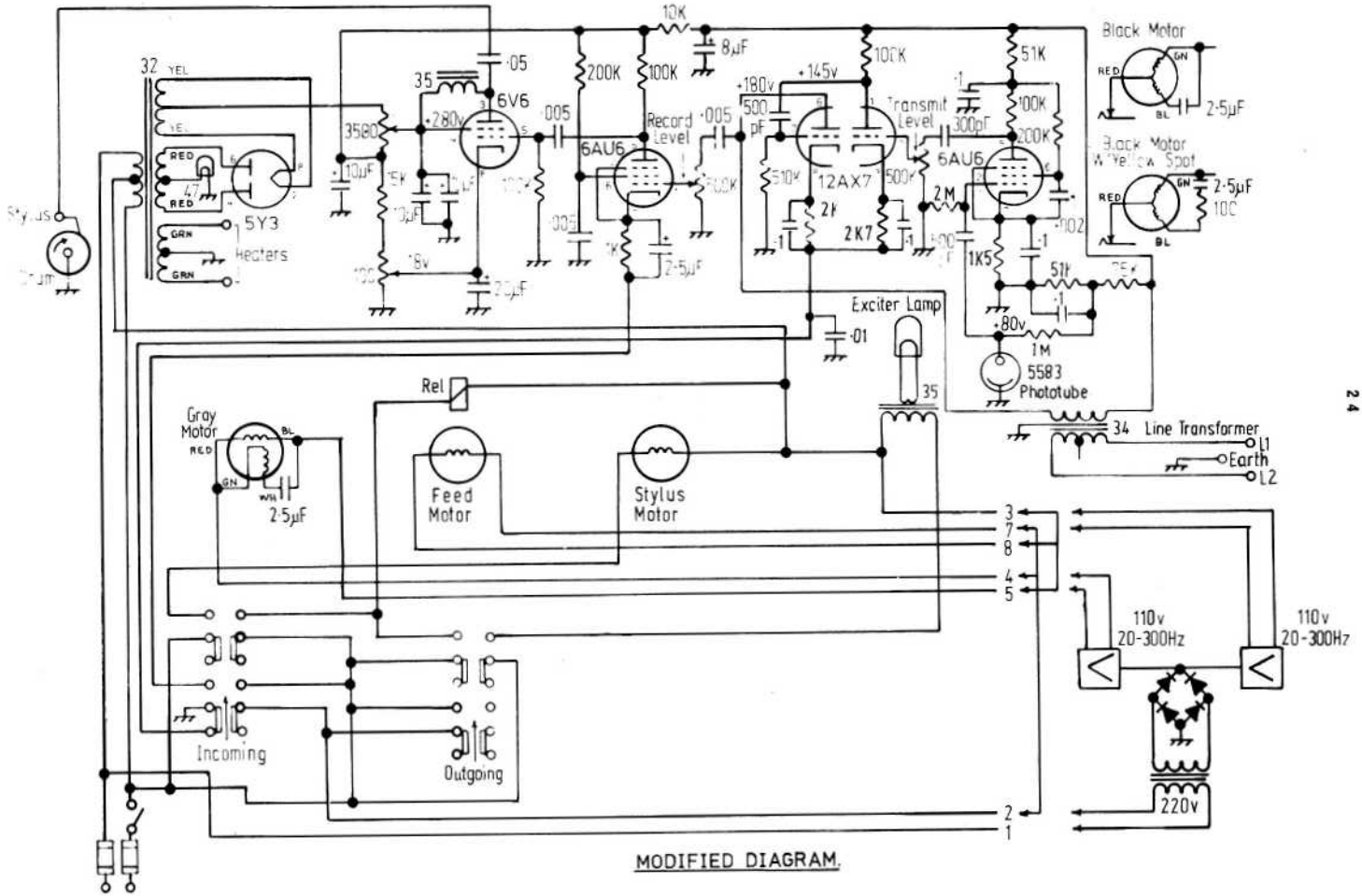
I don't know whether this is of any interest to you, but perhaps.... If transmission of FAX among hams should be a reality, I will mention that Ham Radio has an excellent article describing this in the April issue 1974. If there is any question concerning the receiving system here, please write to me and I will do my best to explain it further.

Best of luck and 73's

LA7MC Jostein Gjerde,
Box 152,
5801 Sogndal, Norway.



ORIGINAL DIAGRAM.



MODIFIED DIAGRAM.

CIRCUIT NOTEBOOK No 20

J. Lawrence GW6JGA'T

CRYSTAL OSCILLATORS

Crystal oscillators are used for many different purposes, e.g. as a stable timing source for a sync pulse generator, a colour sub-carrier generator, a transmitter R.F. source and receiver/convertor local oscillator.

Here is an assortment of circuits covering the range 100 KHz to over 100 MHz.

The circuits in Figures 2 and 3 use a fundamental frequency crystal in the parallel mode of operation.

There is sufficient range of tuning capacitance for the crystal to be set on its exact frequency (most crystals intended for parallel operation require approximately 30pF).

The circuits in Figures 1 and 4 use crystals in the series mode and Figures 5 and 6 use overtone crystals.

In general, with simple low frequency circuits, it is advisable to use transistors with a fairly high beta and a cut off frequency of less than 150 MHz to reduce the possibility of parasitic oscillation at VHF.

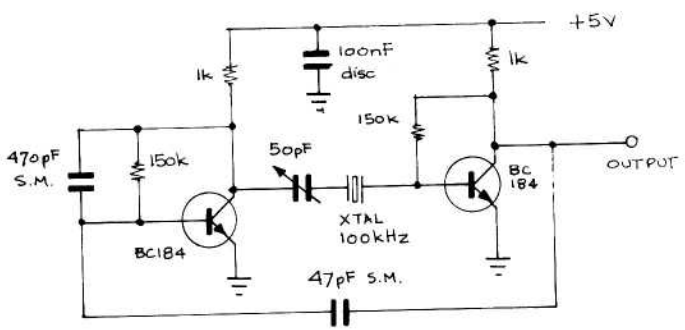


Fig.1 100kHz OSCILLATOR.

For the high frequency circuits, it is important to employ VHF/UHF transistors and to keep all leads, particularly on tuning and decoupling components, as short as possible. Copper-clad board enables a compact circuit to be made with very effective decoupling.

Silvered mica capacitors should be used in the tuned circuits and disc ceramic for decoupling.

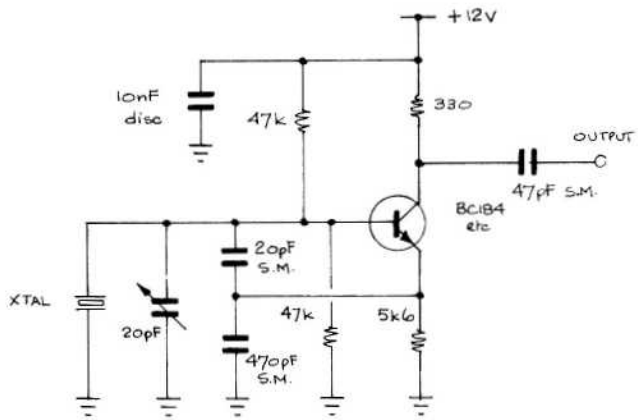


Fig. 2. COLPITTS OSCILLATOR 1-5 MHz

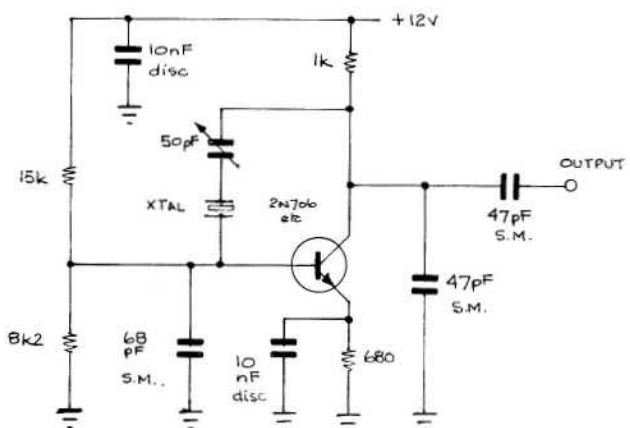


Fig. 3. PIERCE OSCILLATOR 2-20MHz.

The output from Figure 2 is about 500 mV p-p and may require further amplification.

The output from Figure 3 should not be loaded too heavily, so a buffer stage would be a useful addition.

The coil in Figure 5 is tuned to the required output frequency.

If you require more ditailed information, reference 1 is recommended.

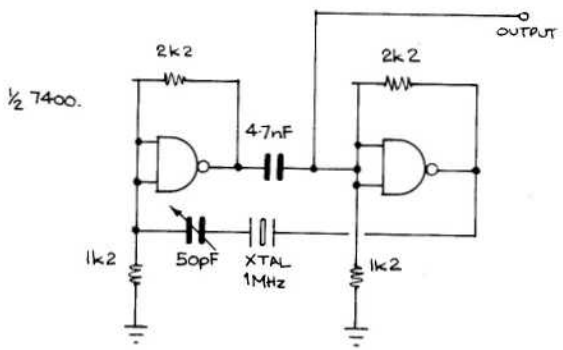


Fig. 4 TTL OSCILLATOR.

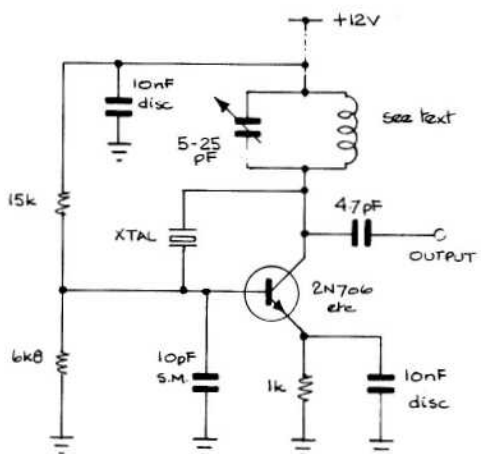


Fig. 5. OVERTONE 3rd or 5th 30 — 100 MHz.

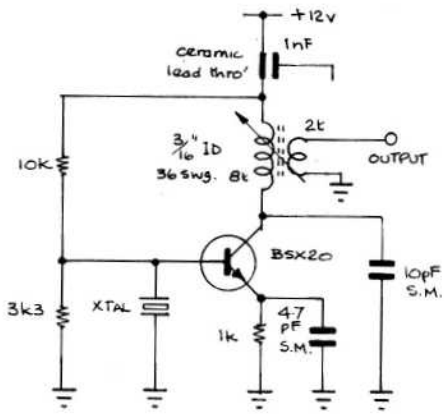


Fig 6 5th OVERTONE 100MHz Typ.

REFERENCES

1. Quartz Crystal Oscillator Circuits
Radio Communication. July 1973 p. 456

2. Oscillators
Ham Radio Magazine. November 1969 p. 68

3. Oscillators
R.S.G.B. VHF-UHF Manual p. 5.8

4. Digital Calibration - Spectrum Generator DJ4BG
VHF Communications November 1971 p. 194

5. Digital Frequency Meter G3TVU G8BDO
Radio Communications July 1971 p. 458

6. Digital Frequency Counter-Timer GW3JGA
Practical Wireless September 1971 p. 404

7. Coil Winding Data
1975 Wireless World Diary p. 29

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Slow Scan Television Handbook by Don Miller & Ralph Taggart £2.00 + 20p p&p (overseas post rates on request)

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